AMENDMENTS TO THE CLAIMS

Listing of Claims

This listing of the claims will replace all prior versions, and listings, of claims in this application.

1. **(Original)** A method of screening for a modulator of PLK, wherein the method comprises using the structure co-ordinates of *Table 2*, or a portion thereof.

2. **(Currently Amended)** [[A]]The method according to claim 1 comprising the steps of:

~~(a) providing at least a portion of the structure co-ordinates of *Table 2*;~~

([[b]]a)employing ~~at least a portion of~~ the structure co-ordinates of *Table 2*, or the portion thereof, to design, [[or]] select or synthesise a putative modulator of PLK;

([[c]]b)contacting the putative modulator of PLK with PLK or a mutant, variant, homologue, derivative or fragment thereof, in the presence of a substrate of PLK; and

([[d]]c)determining whether said putative modulator of PLK modulates PLK.

3. **(Currently Amended)** [[A]]The method according to claim 1 or claim 2 wherein at least one of ~~a portion of~~ the structure co-ordinates of *Table 2*, the portion thereof, ~~and/or~~ the putative modulator of PLK and[[/or]] the substrate are provided on a machine-readable data storage medium comprising a data storage material encoded with machine readable data.

4. **(Currently Amended)** [[A]]The method according to claim 2 or claim 3 wherein the putative modulator of PLK is selected from a library of compounds.

5. **(Currently Amended)** [[A]]The method according to claim 2 or claim 3 wherein the putative modulator of PLK is selected from a database.

6. **(Currently Amended)** [[A]]The method according to claim 2 or claim 3 wherein the putative modulator of PLK is designed *de novo*.

7. **(Currently Amended)** [[A]]The method according to claim 2 or claim 3 wherein the putative modulator of PLK is designed from a known PLK modulator.

8. **(Currently Amended)** [[A]]The method according to claim 2 or claim 3 wherein the design or selection of the putative modulator of PLK is performed in conjunction with computer modelling.

9. **(Currently Amended)** [[A]]The method according to any preceding claim wherein the putative modulator of PLK inhibits PLK activity.

10. **(Currently Amended)** [[A]]The method according to any preceding claim wherein the PLK is PLK1.

11. **(Currently Amended)** [[A]]The method according to any preceding claim wherein the putative modulator of PLK is useful in the prevention and/or treatment of a PLK related disorder.

12. **(Currently Amended)** [[A]]The method according to claim 11 wherein the PLK related disorder is a proliferative disorder.

13. **(Currently Amended)** [[A]]The method according to claim 12 wherein the proliferative disorder is selected from the group consisting of cancer, leukemia, glomerulonephritis, rheumatoid arthritis, psoriasis and chronic obstructive pulmonary disorder.

14. **(Currently Amended)** An assay for identifying a candidate compound capable of modulating PLK, said assay comprising the steps of:

(a) contacting said candidate compound with PLK; and

(b) detecting whether said candidate compound forms associations with one or more amino acid residues corresponding to PLK amino acid residues L59, G60, A65, C67, A80, K82, L130, E131, C133, R135, F183 and D194.

15. **(Currently Amended)** [[An]]The assay according to claim 14 wherein said candidate compound is selected by performing rational drug design with a 3-dimensional model of PLK in conjunction with computer modelling.

16. **(Currently Amended)** [[An]]The assay according to claim 14 ~~or 15~~ which comprises detecting whether said candidate compound forms an association with the amino acid residue corresponding to PLK amino acid residue C67.

17. **(Currently Amended)** A method of identifying a candidate compound capable of modulating PLK, comprising performing an assay using ~~Use of~~ a compound selected from the following:

(i) 5'-thioadenosine, or a derivative thereof;

(ii) staurosporine, wortmannin, purvalanol A, LY294002, quercetin, morin hydrate, or derivatives thereof; and

(iii) 4-[4-(4-methyl-2-methylaminothiazol-5-yl)-pyrimidin-2-ylamino]-phenol; 4-[4-(2,4-dimethyl-thiazol-5-yl)-pyrimidin-2-ylamino]-phenol or 4-[4-(2-amino-4-methyl-thiazol-5-yl)-pyrimidin-2-ylamino]-phenol;

or a pharmaceutically acceptable salt thereof~~, in an assay for identifying candidate compounds capable of modulating PLK~~.

18. **(Currently Amended)** The method of ~~Use according to~~ claim 17 wherein the assay is a competitive binding assay.

19. **(Currently Amended)** The method of ~~Use according to~~ claim 17 ~~or claim 18~~ wherein the assay comprises contacting [[a]]the candidate compound with PLK in the presence of [[a]]the compound selected from:

(i) 5'-thioadenosine, or a derivative thereof;

(ii) staurosporine, wortmannin, purvalanol A, LY294002, quercetin, morin hydrate, or derivatives thereof; and

(iii) 4-[4-(4-methyl-2-methylaminothiazol-5-yl)-pyrimidin-2-ylamino]-phenol, 4-[4-(2,4-dimethyl-thiazol-5-yl)-pyrimidin-2-ylamino]-phenol or 4-[4-(2-amino-4-methyl-thiazol-5-yl)-pyrimidin-2-ylamino]-phenol;

or a pharmaceutically acceptable salt thereof, and detecting any change in the interaction between (i), (ii) or (iii) and PLK.

20. **(Currently Amended)** A PLK modulator identified by the method of any one of claims ~~1~~ 1 to 13, or a candidate compound identified by [[an]]the assay according to any one of claims 14 to 19.

21. **(Currently Amended)** [[A]]The PLK modulator or candidate compound according to claim 20 wherein the PLK modulator or candidate compound inhibits PLK activity.

22. **(Currently Amended)** [[A]]The PLK modulator or candidate compound according to claim 20 or claim 21 ~~which~~ wherein the PLK modulator or candidate compound is capable of forming a covalent bond with the amino acid residue corresponding to PLK amino acid residue C67.

23. **(Currently Amended)** [[A]]The PLK modulator or candidate compound according to claim 22 ~~which~~ wherein the PLK modulator or candidate compound is capable of forming a disulfide bond with the thiol group of the amino acid residue corresponding to PLK amino acid residue C67.

24. **(Currently Amended)** [[A]]The PLK modulator or candidate compound according to claim 20 ~~which~~ wherein the PLK modulator or candidate compound is an irreversible antagonist.

25. **(Currently Amended)** A pharmaceutical composition comprising [[a]]the PLK modulator or candidate compound according to any one of claims 20 to 24 and a pharmaceutically acceptable carrier, diluent, excipient, [[or]]adjuvant or any combination thereof.

26. **(Currently Amended)** A method of preventing and/or treating a PLK related disorder in a subject, comprising administering to said subject a PLK modulator or candidate compound according to any one of claims 20 to 24 and/or a pharmaceutical composition according to claim 25 ~~wherein said PLK modulator, said candidate compound or said pharmaceutical, is capable of causing a beneficial preventative and/or therapeutic effect~~.

27. **(Currently Amended)** [[A]]The method according to claim 26 wherein the PLK modulator or candidate compound is selected from the following:

(i) 5'-thioadenosine, or a derivative thereof[[:]];

(ii) staurosporine, wortmannin, purvalanol A, LY294002, quercetin, morin hydrate, or derivatives thereof; and

(iii) 4-[4-(4-methyl-2-methylaminothiazol-5-yl)-pyrimidin-2-ylamino]-phenol, 4-[4-(2,4-dimethyl-thiazol-5-yl)-pyrimidin-2-ylamino]-phenol or 4-[4-(2-amino-4-methyl-thiazol-5-yl)-pyrimidin-2-ylamino]-phenol;

or a pharmaceutically acceptable salt thereof.

28. **(Cancelled)**

29. **(Currently Amended)** [[A]]The method according to claim 27~~, or use according to claim 28~~, wherein the PLK related disorder is cancer.

30-32. **(Cancelled)**

33. **(Original)** A computer for producing a three-dimensional representation of PLK wherein said computer comprises:

(a) a computer-readable data storage medium comprising a data storage material encoded with computer-readable data, wherein said data comprises the structure co-ordinates of *Table 2*;

(b) a working memory for storing instructions for processing said computer-readable data;

(c) a central-processing unit coupled to said working memory and to said computer-readable data storage medium for processing said computer-machine readable data into said three-dimensional representation; and

(d) a display coupled to said central-processing unit for displaying said three-dimensional representation.

34. **(Original)** A machine-readable data storage medium comprising a data storage material encoded with machine readable data, wherein the data is defined by at least a portion of the structure co-ordinates of *Table 2*.

35. **(Currently Amended)** A method of predicting the structure and/ or function of potential modulators of PLK, comprising using ~~Use of~~ the computer of claim 33 or the machine readable data storage medium of claim 34 ~~to predict the structure and/or function of potential modulators of PLK~~.

36. **(Cancelled)**

37. **(Currently Amended)** A method of solving the crystalline form structure of a protein with significant amino acid sequence homology to a functional domain of PLK, comprising using ~~Use of~~ at least a portion of the structure co-ordinates of *Table 2* ~~to solve the structure of the crystalline form of any other protein with significant amino acid sequence homology to any functional domain of PLK~~.

38. **(Currently Amended)** The method of ~~Use according to~~ claim 37 wherein the ~~structure of the crystalline form of any other protein with significant amino acid sequence homology to any functional domain of PLK is solved using~~ method comprises molecular replacement.

39. **(Currently Amended)** A method of designing, selecting and synthesizing modulators of PLK, comprising using ~~Use of~~ at least a portion of the structure co-ordinates of *Table 2* in molecular design techniques ~~to design, select and synthesise modulators of PLK~~.

40. **(Currently Amended)** A method of developing compounds that can isomerise to reaction intermediates in the chemical reaction of a substrate and PLK-binding compound, comprising using ~~Use of~~ at least a portion of the structure co-ordinates of *Table 2* ~~in the development of compounds that can isomerise to reaction intermediates in the chemical reaction of a substrate or other compound that binds to PLK~~.

41. **Currently Amended)** A method of screening small molecule databases for chemical entities or compounds that modulate PLK, comprising using ~~Use of~~ at least a portion of the structure co-ordinates of *Table 2* ~~to screen small molecule databases for chemical entities or compounds that modulate PLK~~.

42. **(Currently Amended)** The method of claim 27, wherein the disorder is ~~A method of treating~~ a proliferative disorder~~, said method comprising administering to a subject in need thereof a compound selected from the following:~~

~~(i) 5' thioadenosine, or a derivative thereof;~~

~~(ii) staurosporine, wortmannin, purvalanol A, LY294002, quercetin, morin hydrate, or derivatives thereof; and~~

~~(iii) 4 [4 (4 methyl 2 methylaminothiazol 5 yl) pyrimidin 2 ylamino] phenol, 4 [4 (2,4 dimethylthiazol 5 yl) pyrimidin 2 ylamino] phenol or 4 [4 (2 amino 4 methyl thiazol 5 yl) pyrimidin 2 ylamino] phenol;~~

~~or a pharmaceutically acceptable salt thereof, in an amount sufficient to inhibit PLK such that said proliferative disorder is treated~~.

43. **(Currently Amended)** [[A]]The method of claim 42, wherein the PLK modulator or candidate compound inhibits PLK ~~treating a proliferative disorder comprising inhibiting PLK by administering to a subject in need thereof, a therapeutically effective amount of a compound selected from the following:~~

~~(i) 5' thioadenosine, or a derivative thereof;~~

~~(ii) staurosporine, wortmannin, purvalanol A, LY294002, quercetin, morin hydrate, or derivatives thereof; and~~

~~(iii) 4 [4 (4 methyl 2 methylaminothiazol 5 yl) pyrimidin 2 ylamino] phenol, 4 [4 (2,4 dimethyl thiazol 5 yl) pyrimidin 2 ylamino] phenol or 4 [4 (2 amino 4 methyl thiazol 5 yl) pyrimidin 2 ylamino] phenol;~~

~~or a pharmaceutically acceptable salt thereof, such that treatment of the proliferative disorder occurs~~.

44. **(Cancelled)**

45. **(Currently Amended)** [[A]]The method according to claim [[45]]27 wherein the PLK ~~dependent~~ related disorder is a disorder associated with increased PLK activity.

46. **(Cancelled)**

47. **(Original)** A method of inhibiting PLK in a cell comprising contacting said cell with ~~an amount of~~ a compound selected from the following:

(i) 5'-thioadenosine, or a derivative thereof;

(ii) staurosporine, wortmannin, purvalanol A, LY294002, quercetin, morin hydrate, or derivatives thereof; and

(iii) 4-[4-(4-methyl-2-methylaminothiazol-5-yl)-pyrimidin-2-ylamino]-phenol, 4-[4-(2,4-dimethyl-thiazol-5-yl)-pyrimidin-2-ylamino]-phenol or 4-[4-(2-amino-4-methyl thiazol-5-yl)-pyrimidin-2-ylamino]-phenol;

or a pharmaceutically acceptable salt thereof, such that PLK is inhibited in said cell.

48. **(Currently Amended)** [[A]]The method according to claim 47 wherein the cell is a cancer cell.

49. **(Original)** A fragment of PLK, or a homologue, mutant, or derivative thereof, comprising a ligand binding domain, said ligand binding domain being defined by the amino acid residue structural coordinates selected from one or more of the following: L59, G60, A65, C67, A80, K82, L130, E131, C133, R135, F183 and D194.

50. **(Original)** A fragment of PLK, or a homologue, mutant or derivative thereof, according to claim 49 which corresponds to a portion of the structure co-ordinates of *Table 2*.

51. **(Currently Amended)** A method of identifying a candidate compound capable of modulating PLK, comprising performing an assay using the ~~Use of a~~ fragment of PLK, or [[a]]the homologue, mutant, or derivative thereof, according to claim 49~~50 or 51 in an assay for identifying candidate compounds capable of modulating PLK~~.

52-55. **(Cancelled)**